

22. (New) The gas assist mold dump valve of claim 21 wherein the check valve includes having a valve head and an internal spring, the internal spring biasing the valve head the said closed position.

REMARKS

Claims 3-6 have been cancelled, new claims 10-22 have been added. In the Office Action, the Examiner rejected claims 3-6 and 8 under 35 U.S.C. §103(a) as being unpatentable over Reilly in view of Quartana. Applicant submits that the prior rejections are moot in view of the claims and currently amended.

As supported by the attached declaration of inventor Andrew McKaig (which is attached hereto as Exhibit A and incorporated herein by reference), one having skill in the art would understand that the piston of the regulator of the present invention may placed in three possible positions, i.e., to wit: full open, full closed or an intermediate position balanced between the full open and full closed.

For example during the process of increasing the pressure of the fluid from the controller, the internal pressure of the mold cavity, being lower than that of the gas controller outlet due to the positive rate of change of the pressure on the outlet of the controller, provides for a resultant force that biases the near one to one piston into a position that positively closes the venting side of the valve. The pressure drop across the valve body will allow gas to flow through the check valve portion of the valve and into the mold cavity. As a result, the valve position is fully closed and seated by a positive force.

Decreasing the gas pressure on the inlet side of the vent valve by the gas controller allows the higher pressure on the mold side of the cavity to overcome the force holding the valve in the closed position and will push the valve to a position between not closed and fully

open in a manner that will be proportional to the rate of change of the gas pressure on the inlet side of the valve. The gas vented from the mold side of the valve will be directed through said valve to a third port while checking any contaminated gas from passing through to the controller hardware. As a result, the valve position is positioned between the fully open and fully closed position to allow for controlled venting.

Finally the gas controller of the present invention can maintain a constant pressure set point at some pressure between the minimum and the maximum pressure required by the mold cavity during either the filling or the venting portion of the pressure profile. During this fixed inlet pressure state, drops in cavity pressure due to increases in part internal volume or part cooling will cause the gas to flow through the internal check valve. Increases in mold pressure due to the addition of plastic material or the increase in mold temperature will overcome the positive seal on the valve seat causing leakage and allowing excess gas to vent from the valve. As a result the valve is closed, but with only a minimal force on the seat to provide for bi-directional leakage into and out of the mold cavity as necessary.

New claims 10 and 16 are directed to the regulator that allows for bi-directional leakage into and out of the mold cavity. New claims 13 and 20 are directed to the piston being in a position between not closed and fully open in a manner that will be proportional to the rate of change of the gas pressure on the inlet side of the valve. Each of these claims also teach the use of a piston that is dimensioned such that the regulator is calibrated to have a near to 1:1 dome-to-seat area ratio. Reilly clearly does not teach or suggest such piston. The remaining claims concern the use of a check valve.

In view of the above amendments and remarks, Applicant submits that the application is now in proper form for allowance. Such action is respectfully requested.

The Commissioner is authorized to charge any fee or credit in the overpayment in connection with this communication to our Deposit Account No. 07-1180.

Respectfully submitted,



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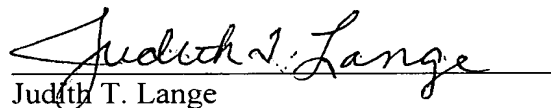
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